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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 890,103	09 25 2001	Naoki Yasuda	401312	6079

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EXAMINER

BISSETT, MELANIE D

ART UNIT PAPER NUMBER

1711

DATE MAILED: 12 13 2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09.890.103

Applicant(s)

YASUDA ET AL

Examiner

Melanie D Bissett

Art Unit

1711

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 01/25/01 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,6,7
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "42" has been used to designate both a silicon substrate and a sensing portion. See specification, pages 25-28. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3-6 and 9-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Formulas (1) and (2) indicate variables l , m , and n as either "integers and at least 0" or "integers", where 0 and negative numbers are integers. Description of formula (1) encompasses each of l , m , and n to be 0, and description of formula (2) encompasses n to be 0. It is unclear in this case whether the applicant intends to make the silicone polymers optional or whether the applicant intends to claim $l+m+n \geq 1$ (formula (1)) and $n > 0$ (formula (2)).

Claim Objections

5. Claims 3-6 and 9-12 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. As previously stated, formulas (1) and (2) indicate variables l , m , and n as either "integers and at least 0" or "integers", where 0 and negative numbers are integers. Regarding formula (1), a situation where $l=m=n=0$ would render the silicone polymer not present, where claims 1 and 8 require the presence of a silicone polymer layer. Therefore, in this case, claims 3 and 9 would not further limit claims 1 and 8. Regarding formula (2), a situation where $n=0$ would render the silicone portion of the polymer not present, where claims 1 and 8 require the presence of a silicone polymer layer. Therefore, in this case, claims 4 and 10 would not further limit claims 1 and 8.

Summary of the Claims

6. Claim 1 is drawn to a sensor element comprising a sensor substrate, a flat sensing portion on the substrate, and a silicone resin film covering the sensing portion. Claim 8 is drawn to a method of fabricating a sensor element by coating a flat sensing portion supported by a substrate with a silicone polymer solution, heating, and curing the silicone solution. Claims 2-6 and 9-10 limit the silicone polymer, claim 7 limits the sensor element, and claims 11-13 limit curing steps. Because the polymers represented by formula (1) are cured, the examiner interprets the open bonds attaching the oxygen atoms in the first two repeat units as crosslinks to other silicone structures.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3, 8-9, and 13 are rejected under 35 U.S.C. 102(b) as being anticipated by Kinjo et al. Kinjo et al. (USPN 4,473,813-A) can be found on the applicant's Form PTO-1449.

9. Kinjo discloses a humidity sensor having a protective crosslinked silicone resin film (abstract). Figure 3 shows a substrate provided with electrodes and a flat humidity-sensitive film, where a protective silicone resin film is provided on the humidity sensing

layer. Patterns (A)-(C) show the formation of polymers having $n \geq 1$ (A and B) and $l \geq 1$ (C) (col. 6-7). The examples show the use of crosslinked silicone polymers having molecular weights of 34,000 (see examples 4 and 8). The solutions of silicone resin material are spin-coated onto the sensing layer, heated at 100 °C and 150 °C, and cured. Although the reference does not specify weight average molecular weight, it is the examiner's position that the molecular weight given would suggest high molecular weights (above 1000 g/mol) for each definition of molecular weight.

10. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Toshiba Corp. Toshiba Corp. (JP 60-62278 A2) can be found on the applicant's Form PTO-1449. However, the incorrect Japanese version (JP 6-62278 A2) of this reference was cited and submitted. The examiner has corrected the Form PTO-1449 and submitted the correct Japanese patent for the applicant's reference.

11. Toshiba discloses an image sensor having a board substrate, sensing layers, and a transparent silicone resin layer (abstract). Figures 1-3 show silicone resin films covering sensing layers, where at least part of the sensing layers appear flat.

Therefore, it is the examiner's position that the reference teaches the applicant's claimed sensor elements of claims 1 and 7.

12. Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Rika Kogyo KK. Rika Kogyo KK (JP 04-184160) can be found on the applicant's Form PTO-1449.

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13. Rika Kogyo KK discloses a humidity sensor having a substrate, a humidity sensitive film, an electrode, and a protective film such as silicone polymer (abstract). Figure 1 shows a structure, where the protective film covers the humidity sensitive film and the electrode, where at least a portion of the humidity sensitive film and electrode appear flat.

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 4 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Idemitsu Petrochem Co. in view of Miyata et al.

16. Idemitsu Petrochem Co. discloses devices such as optical sensors having a substrate, a diamond film, and electrodes (abstract). The figure shows at least a portion of the sensing surfaces as flat. However, the reference does not teach the use of a protective film having a ladder structure. Miyata teaches articles comprising a diamond substrate with a protective spin-on glass ladder silicone material (abstract). The reference notes the use of diamond materials in optical sensors (col. 1 lines 13-33) and notes that etching on diamond is required to be used in electronic devices (col. 1 lines 51-60). The use of the silicone material in an etching process improves the stability of the pattern size and enables microfabricating in the submicron range (col. 3 lines 31-

38). Idemitsu Petrochem Co. discusses etching of the diamond film and formation of electronic devices. It is the examiner's position that it would have been prima facie obvious to include the silicone material of Miyata's invention on the optical sensor of Idemitsu Petrochem Co. to improve the stability of the pattern in the etching process.

Allowable Subject Matter

17. Claims 5-6 and 11-12 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

18. The closest prior art, Kinjo et al. (USPN 4,473,813-A) discloses a humidity sensor having a protective crosslinked silicone resin film. Figure 3 shows a substrate provided with electrodes and a flat humidity-sensitive film, where a protective silicone resin film is provided on the humidity sensing layer. However, the reference does not teach polymers of formulas (1) or (2) which are photocured. It is the examiner's position that the curing of the applicant's claimed silicone structures by light provides a novel, unobvious step over the prior art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melanie D. Bissett whose telephone number is (703) 308-6539. The examiner can normally be reached on M-F 8-4:30.

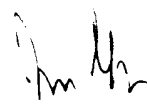
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone

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numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

mdb
December 9, 2002



James J. Seidleck
Supervisory Patent Examiner
Technology Center 1700